

REMARKS

In view of the above amendments and following remarks, reconsideration of the rejections contained in the Office Action of June 4, 2003 is respectfully requested.

Initially, it is noted that a number of minor editorial changes have been made to the specification and abstract for the sake of form.

Applicants acknowledge the Examiner's comments in section 1 on page 2 of the Office Action. Enclosed herewith is a formal claim for priority submitting the certified copy of the foreign priority application.

The Examiner rejected claim 5 as being indefinite. The Examiner consider this claim to be unclear because claim 1 states that the top ring or the table reciprocates, and claim 5 states that the top ring reciprocates in a third direction. However, it is respectfully submitted that this is not unclear. The language of claim 5 is not inconsistent with that of claim 1, but simply narrows the overall requirements of the claims. Furthermore, it is entirely consistent with the description in the specification. More specifically, claim 1 requires that the polishing table move relatively to the top ring, and at least one of the top ring and the polishing table reciprocates linearly in a first direction. Claim 5 simply additionally requires that the top ring reciprocate linearly in a third direction that intersects the first direction. This is not inconsistent with claim 1, and is consistent with the way in which the invention operates. As such, it is not seen how the claim limitation can be considered indefinite. Should the Examiner maintain this rejection, clarification with respect to perceived lack of clarity of this language is requested.

The Examiner further rejected claims 1-6, 9 and 10 as being clearly anticipated by Sommer et al., U.S. 6,447,374 (Sommer). The Examiner further rejected claims 7 and 8 as being unpatentable over Sommer in view of Elder, U.S. 6,428,407 (Elder). However, it is respectfully submitted that the present invention, as set forth in claim 1, as well as now set forth in additional claims 11 and 12, clearly patentably distinguishes over both Sommer and Elder.

The present invention is directed to an improvement of the prior art as is for example illustrated and described with respect to Fig. 23 in the background of the invention of the present specification. In Fig. 23, a polishing apparatus 101 has a belt 102 have a resilient polishing pad

105 applied to an outer surface thereof. The belt 102 is wound on a pair of rollers 103 and 104. A back up plate 109 is held against the reverse side of the belt, with a top ring 108 confronting the belt 102 at the position of the back up plate 109.

As described in the background, for this structure the polishing pad 105 cannot be easily replaced with a new polishing pad. Furthermore, the resilient polishing pad 105 tends to cause polishing in the recesses of the semiconductor wafer W. Furthermore, attempts at using a fixed abrasive to resolve the problem with the resilient polishing pad have been unsuccessful because the belt 102 is flexible.

Accordingly, the present invention provides a polishing apparatus in which a polishing pad can be easily replaced and in which a fixed abrasive can be easily used.

In accordance with the invention as now described in amended claim 1, the polishing apparatus includes a top ring for holding a workpiece to be polished. A polishing table is linearly movable relative to the top ring. The polishing table has a polishing surface for polishing the workpiece held by the top ring. At least one of the top ring and the polishing table reciprocates linearly in a first direction, furthermore.

Thus, by providing a polishing table that is linearly movable relative to the top ring, such as polishing table 12 as for example shown in Figs. 1, instead of a belt as described with respect to the prior art of Fig. 23, the polishing surfaces 14 and 15, which may be in the form of polishing pads as described in the specification, and which may include a fixed abrasive as also described in the specification, can be easily replaced.

The cited patent to Sommer does not use a polishing table. Rather, Sommer discloses a belt, described as a web, similar to the prior art of Fig. 23. The web 114 of Sommer is not a polishing table. The web 114 is flexible and cannot be easily replaced with the new polishing surface. Further, because the web 114 is flexible, it will be difficult to use a fixed abrasive to prevent so-called dishing as described in the background of the invention of the present application.

For the above reason, it is respectfully submitted to be clear that Sommer fails to disclose or suggest the present invention as recited in claim 1. Sommer simply does not have a polishing table, as required by the claim.

With respect to claim 10, it is noted that Sommer further fails to disclose or suggest either a linear guide or fluid pressure with said linear guide for supporting the polishing table.

The Examiner further cited Elder to reject claims 7 and 8. However, it is respectfully submitted that Elder is non-analogous prior art.

To determine whether a reference constitutes analogous prior art that may be looked to by the Examiner for purposes of attempting a combination rejection, such reference must either be within the field of endeavor of Applicants' invention, or it must be particularly related to the problems with which Applicants were addressing. Applying these tests to Elder makes it clear that Elder does not constitute analogous prior art.

The field of the present invention relates to polishing apparatus in particular for polishing substrates for use in semiconductor devices. This is a highly specialized field requiring exact precision for the apparatus used to polish semiconductor wafers. By contrast, and as described in column 1, Elder relates to tools for manual finishing of surfaces. Manual finishing of a semiconductor wafer is not something that can be contemplated in today's world. It is clear that Elder is in a distinctly different field than the present invention.

The problems with which the present inventors were addressing have to do with the difficulty of replacing a polishing pad when using a flexible endless belt, the phenomenon of dishing when using a resilient polishing pad and the difficulty of using a fixed abrasive because of the use of a flexible belt. None of these problems are addressed by Elder. Rather, Elder is addressing a need for an abrasive tool for manually finishing small surface areas which has degrees for displaying the grit size and the abrasive mineral content. This does not relate to the present invention in any way.

Accordingly, the Examiner is not permitted to employ Elder in any combination rejection under 35 U.S.C. §103 against the claims of the present application. As such, the Examiner's rejection of claims 7 and 8 must be withdrawn for this reason alone.

It is additionally noted that one of ordinary skill in the art would never have considered attempting any application of Elder to Sommer, which is a semiconductor wafer processing system. Simply because something is "well-known" does not make its use obvious. Being well-known, even if Elder could be taken to stand for such a proposition, does not by itself make a feature obvious in some other context, particularly when that context is a very different and highly specialized field. Elder teaches no reason for a groove between different sections of abrasive material applicable to Sommer. Also it does not teach any reason for different degrees of coarseness for the web 114 of Sommer. Elder does not relate to semiconductor polishing at all. For this reason as well, the Examiner's rejection of claims 7 and 8 must be withdrawn.

New claims 11-13 distinguish over the references cited by the Examiner for the same reasons as discussed above. That is, all of the claims require a polishing table. In addition, further features are recited which also distinguish over these claims, including the necessity of a linear guide upon which the polishing table is mounted so as to be capable of linearly being reciprocated. The claim further requires at least one polishing pad fixed on the polishing table for polishing the workpiece held by the top ring.

For all of the reasons presented above, the present invention clearly patentably distinguishes over Sommer and Elder. Indication of such is respectfully requested.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance, and the Examiner is requested to pass the case to issue. If the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact Applicants' undersigned representative.

Respectfully submitted,

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